Brookhaven National Laboratory/National Synchrotron Light Source			
Subject:	**Temporary Restrictions to DUV-FEL Operating Envelope**		
Number: LS-SDL-0034	**Revision:** B	**Effective:** 10/20/2005	**Page** 1 **of** 2

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*Approval signatures on file with master copy.

Revision Log

This document provides a formal definition of the current administrative procedures restricting operating currents for the DUV-FEL. It also establishes the process to modify or revoke these restrictions in the future.

Background - Area monitoring data and fault studies conducted during the past several years indicate the potential for exceeding the 100 mRem/year administrative control level (ACL) at the maximum operating current 20 nA currently established in the SDL Operating Envelope. To keep radiation levels well below 100 mRem per year, initially it was agreed to restrict operating currents on the DUV-FEL to no more than 1.25 nA (typically obtained at 0.5 nC per pulse with a repetition rate of 2.5 hertz). Since that time, additional shielding has been provided over key loss points, and the routine operating energy of the DUV-FEL has been reduced to about 130 MeV to accommodate its primary research mission. These changes have reduced the projected maximum annual exposures to personnel for 2005 to about 10 mrem. Personnel monitoring data from TLD dosimeters worn by personnel working in the building continue to indicate no recorded exposure, primarily because of the more frequent change of the personnel TLDs compared to the area monitors. These reductions in projected dose permit an increase in the routine operating currents authorized by the previous version of this procedure.

Since the scattered skyshine radiation affecting building occupant exposure is directly proportional to the beam power, the reduction in operating energy permits an increase in the operating current by the same factor. The previous procedure permitted 1.25 nA at 270 MeV, corresponding to an operating power of 0.34 watt. Based on area monitoring data accumulated in 2004, an increase in power by about a factor of 2 should maintain the maximum annual dose estimated from the area monitors in the 50 mrem range, still well within the ACL.

It should be noted that the current dose limitation in the DUV-FEL operating envelope is quite conservative in that the safety limit for DUV-FEL operation is 1250 mrem per year. Projected operations at the maximum allowable current of 20 nA would not exceed this safety limit established in the ASE. However, such operation would require that the administrative control level be increased from 100 to a value of 500 – 1000 mrem per year. This option is not ruled out in the future, but at this stage of DUV-FEL operations, we will maintain the current ACL and limit operations in a manner that keeps annual dose as projected by area monitoring data to less than 100 mrem.

Stipulation - It is understood and agreed that the DUV-FEL will not operate at conditions that exceed the maximum energy permitted in the ASE and will not exceed a total average beam power of 0.6 watts.

These operating restrictions can be relaxed as shielding improvements reduce radiation levels in occupied areas. Fault studies and area monitoring data demonstrating improved radiation levels will be required prior to operation at higher beam powers. Approval by the NSLS Associate

Chair for ESH and Associate Chair for Accelerators is required. This document will be revised and re-issued to reflect any new administrative controls that remain. This document will be treated as formal DUV-FEL operating policy and will be retained in the NSLS controlled document system.